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ABSTRACT

While static economic theory predicts that most income transfer programs will lead to reductions in the labor supply of program beneficiaries, the theory has nothing to say about the magnitude of such reductions. In order to predict the magnitude of such reductions the labor supply schedule of potential beneficiaries must be known. In three previous papers, estimates for married and single prime age (25-34) men; prime age married and single women, and female household heads; and younger men and women were presented. In this paper, estimates are presented for several groups of older men and women. In the first section of this paper, data are described upon which the analysis is based. The next sections present and discuss the results for the demographic groups. The final section contains a brief summary and conclusion. It is found that, for the most part, the results are consistent with prior expectations. In general, the income effects are negative and the substitution effects are positive. The elasticities for older men and women are larger than those for prime age married men. While the labor supply elasticities of men below retirement age are smaller than those for women, the labor supply elasticities of men over age 65 are generally just as large as those for women. (Author/JM)

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THE EFFECT OF INCOME AND WAGE RATES ON THE LABOR SUPPLY OF OLDER MEN AND WOMEN

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ABSTRACT

In this paper we present estimates of income, wage rate, and substitution elasticities for several groups of older men and women. For the most part, the results are consistent with a priori expectations. In general the income effects are negative and the substitution effects are positive. As expected, the elasticities for older men and women are larger than those for prime age married males. While the labor supply elasticities of men below retirement age are smaller than those for women, the labor supply elasticities of men over age 65 are generally just as large as those for women.

THE EFFECT OF INCOME AND WAGE RATES ON THE LABOR SUPPLY OF OLDER MEN AND WOMEN

INTRODUCTION

While static economic theory predicts that most income transfer programs will lead to reductions in the labor supply of program beneficiaries, the theory has nothing to say about the magnitude of such reductions.[1] In order to predict the magnitude of such reductions, the labor supply schedule of potential beneficiaries must be known. The purpose of this and three previous papers is to present some empirical estimates of the labor supply schedules of a wide variety of demographic groups. A major theme of the papers is that problems which inhere in the available data prevent us--and other researchers--from making very precise estimates of the labor supply functions of any demographic group. As a result, while empirical studies of labor supply can reduce some of the uncertainty about the magnitude of the labor supply reductions which would be induced by transfer programs, much uncertainty remains.[2]

It is both informative and necessary to estimate separate labor supply functions for different demographic groups because there are a priori reasons and supporting empirical evidence for believing that the income and substitution elasticities of labor supply vary considerably across demographic groups.[3] For example, because prime age husbands are subject to very strong social pressures to do market work while wives are not subject to as much social pressure to either work or not work,

the income and substitution elasticities of husbands should be much smaller than that of wives. In three previous papers we presented estimates for married and single prime age (25-54) men; prime age married and single women, and female household heads; and younger men and women. In this paper we present estimates for several groups of older men and women.

In the first section of this paper we describe the data upon which our analysis is based. (This section is virtually identical to the first sections in the three previous papers.) The next sections present and discuss our results for the demographic groups. The final section contains a brief summary and conclusion.

I. DATA BASE AND VARIABLE DEFINITIONS

Our analysis is based on two data sources: the Survey of Economic Opportunity (SEO) and the Michigan Institute for Social Research--OEO Income Dynamics Panel Study (ISR-OEO). The SEO, conducted only for the years 1966 and 1967, was designed to supplement the Current Population Survey. Data were collected from 30,000 households, consisting of (1) a national self-weighting sample of 18,000 households and (2) a supplementary sample of 12,000 households from areas with a large percentage of nonwhite poor. We use only the 1967 self-weighting portion of the sample in our analysis.[4] The ISR-OEO study was a five-year longitudinal study conducted during the years 1968 through 1972. Of the 4,802 families interviewed in 1968, 1,872 were from the SEO low-income supplementary sample. The rest consisted of a national cross section of the

U.S. population. Sample size decreased because of nonresponse and increased because of new family formation. By 1972, therefore, the sample consisted of 5,060 families, 1,108 of which were newly formed since the 1968 interview. Because of the smaller sample size we use the total ISR-OEO sample and run weighted regressions to take account of the nonrandom character of the sample.

A. Labor Supply Measures

Numerous measures of labor supply can be constructed from the SEO data. Adult household members were asked how many hours they worked last week, how many weeks they were employed last year, and whether they normally worked full or part time last year. Paid vacation and paid sick leave are included in the SEO definition of weeks employed but not in the definition of hours worked in the survey week. In addition, adults who worked less than 50-52 weeks or less than full time during most weeks were asked to give the major reason why they were less than full-time workers. (Unfortunately, adults who worked less than full time in the week prior to the survey were not asked why.) From the answers to these questions we have constructed the following measures of labor supply:

1. HLF_A = the product of weeks in the labor force (weeks employed plus weeks unemployed) and 40 if the individual either normally worked full time or wanted to work full time or 20 if the individual voluntarily worked part time.

2. $HEMP_A$ = the product of weeks employed and 40 if the individual normally worked full time during the year or weeks employed and 20 if the individual worked part time.

3. $EMPDUM_A$ = a dummy variable which assumes the value of 1 if $HEMP_A > 0$ and zero if $HEMP_A = 0$.

4. HWK_{SW} = hours actually worked during the survey week.

5. $HWK_{SW} \leq 40$ = HWK_{SW} or 40, whichever is smaller.

6. $WKDUM_{SW}$ = a dummy variable equal to 1 if $HWK_{SW} > 0$ and zero if $HWK_{SW} = 0$.

There are several important differences among these variables. The last five are measures of either time employed or time actually working, while the first is a measure of time spent looking for work as well as time spent employed. Measures 2, 3, 4, 5, and 6, therefore, are more likely to reflect cross-sectional differences in the demand for as well as the supply of labor. (Since inability to find a job leads to labor force withdrawal in some cases, cross-sectional differences in the demand for labor are also likely to be reflected in the time-in-labor force measures!) In particular, if as is undoubtedly the case, the tightness of the market varies directly with skill level, low wage workers will be laid off more often and rehired less rapidly than high wage workers. Thus, the wage rate coefficients in these five measures will be positively biased.

On the other hand, the allocation of time between search for employment and actual employment is at least in part subject to the individual worker's control. Moreover, we expect the individual's decision to be influenced by economic considerations. The larger the individual's non-employment income, the better able is he to afford to spend time looking for a satisfactory job. Similarly, the higher his potential wage rate, the better able is he to afford to spend time looking for a satisfactory job. But the higher his wage rate, the more costly is the time he spends not working. If the substitution effect dominates, the wage rate coefficient

will be more positive in the time-employed than in the time-in-the-labor-force measures of labor supply. Thus, wage coefficients may be more positive in the time-employed labor supply measures either because the wage rate coefficients are more likely to inappropriately reflect cross-sectional differences in the demand for as well as the supply of labor or because these coefficients appropriately reflect the wage rate elasticity of job-search time. Because it is not possible to determine whether the differences between the time-employed and the time-in-the-labor-force measures are due to the first or second of these factors, we will present results for both of these measures.

The variables also differ in the degree to which they are comprehensive measures of labor supply. Our major focus in the discussion of the results will be on the most comprehensive measures of $HEMP_A$, HLF_A, HWK_{SW}, $HWK_{SW} \leq 40$. Only the HWK_{SW} variable measures overtime hours worked during the week. The $HWK_{SW} \leq 40$ variable is constructed in order to facilitate the isolation of the overtime labor supply schedule. Since $HWK_{SW} \leq 40$ treats overtime labor supply as equivalent to full-time labor supply, it is comparable to $HEMP_A$, the major differences being that (1) it contains a more continuous measure of hours worked during the week than $HEMP_A$ and, more important, (2) unlike $HEMP_A$, it may be sensitive to seasonality problems.[5] The difference between the HWK_{SW} and $HWK_{SW} \leq 40$ coefficients can be attributed to the effects of overtime. There are at least three reasons for separating out the effects of overtime. First, doing so facilitates comparison with our annual-hours-employed measure. Second, the overtime labor supply of some groups is likely to be more responsive to economic incentives. This would be particularly true of prime age males, for

example, who are expected to work full time but not necessarily overtime. Third, and closely related to the second point, our ultimate interest is in using these estimated labor supply schedules to predict the labor supply reductions which would be induced by a negative income tax program. Since reductions from overtime to full-time labor supply are almost certain to be more socially and politically acceptable than reductions from full-time to less than full-time labor supply, it is important to distinguish between the two kinds of labor supply responsiveness.

In the ISR-OEO study, household heads and their spouses were asked how many weeks they worked last year and how many hours they normally worked during the weeks that they worked. In addition, household heads who worked less than 52 weeks were asked how many weeks of work they missed because of unemployment or a strike, because of illness, or finally because of vacation. Thus, in the ISR-OEO study, a measure of annual hours actually worked, in contrast to annual hours employed, is available and for heads it is also possible to construct a measure of annual hours in the labor force. Moreover, it is possible to replicate our principal SEO measures of labor supply HLF_A and $HEMP_A$. For household heads then we use the following measures of labor supply:

1. HWK_A = the product of weeks worked and normal hours worked per week.
2. $HWK_A \leq 2000$ = HWK_A or 2,000, whichever is smaller.
3. $HLF_A\text{-}SEO_R$ = a recoded measure of HLF_ASEO in which the weeks in the labor force measure is recoded into the same categories in SEO and the normal hours worked variable is set equal to 40 if it is equal to 35 or more, and 20 otherwise.
4. EMP_A = 1 if $HWK \geq 1$.

The ISR-OEO annual-hours-worked (HWK_A) measure is superior in several ways to the SEO measure of annual hours employed ($HEMP_A$). First, it is a comprehensive annual measure of labor supply that includes overtime work. Second, the measure of annual hours worked is conceptually preferable to a measure of annual hours employed (equals hours worked plus paid vacation and sick leave) because whether it is paid for or not time spent vacationing constitutes leisure. Moreover, measures of labor supply which include paid vacation and sick leave are likely to result in positively biased wage rate coefficients. For the lower the wage rate, the less probable it is that the worker will have a job with paid vacation or paid sick leave. Consequently, the vacations and illnesses of those with lower wage rates are likely to be counted as leisure rather than as hours employed, while the vacations and illnesses of those with higher wage rates are more likely to be counted as hours employed. Another way of putting this is that the SEO measure of time employed does measure time employed for those with paid vacation and sick leave but measures time employed less time spent on vacation and illnesses for those who are not fortunate enough to have jobs with paid vacation and sick leave.

B. Unearned Income Measures

In order to derive an estimate of the effect of income on the labor supply of an individual, it is necessary to have a measure of the income that he has which does not depend on how much he works. Earnings of other family members and family nonemployment income (NEY) are two sources of income which do not depend directly on how much the individual works. Unfortunately, in many instances they depend indirectly on how much he works. We consider NEY first.

Reported NEY in the SEO includes family income from (1) Social Security (old age, survivor's, and disability insurance [OASDI]) or railroad retirement, (2) pensions from retirement programs for government employees or military personnel or private employees; (3) veteran's disability or compensation (VD); (4) public assistance, relief, or welfare from state or local governments (PA); (5) unemployment insurance; (6) workmen's compensation, illness, or accident benefits (WC); (7) other regular income such as payments from annuities, royalties, private welfare, or relief: contributions from persons not living in the household; and alimony or Armed Forces allotments; (8) interest; (9) dividends; and (10) rent. In addition, data are available on family assets.[6] Negative correlations between components of NEY and labor supply may be observed for one of three reasons: (1) NEY leads to reduced work effort, (2) involuntary limitations on work effort lead to NEY, or (3) some third factor simultaneously causes higher-than-average work effort. Only the first should be considered for purposes of estimating a labor supply schedule. Correlations between public assistance, unemployment compensation, veteran's pensions, workmen's compensation, and retirement pensions on the one hand, and labor supply on the other hand, are likely to be observed for either the second or third reason.

Consider public assistance. A priori, it is impossible to specify whether public assistance beneficiaries work less in order to receive aid, or receive aid because of limitations in the work they can do. In the latter case, public assistance payments should not be included in NEY since causation runs the wrong way. But consider for a moment the implications of the former hypothesis. If beneficiaries work less in order to

qualify for public assistance, nonbeneficiaries could supposedly do the same thing. That is, beneficiaries and nonbeneficiaries with the same potential wage rate face identical budget constraints.[7] To attribute their differences in work effort to differences in NEY is erroneous. The differences in this case must be a result of different tastes.[8] Consequently, whether the (promised) receipt of public assistance leads to reduced work effort or vice versa, public assistance payments should not be included in NEY.[9]

The same arguments apply to unemployment compensation (UC) beneficiaries. If one assumes that the receipt of UC depends upon involuntary cessation or reduction of work, clearly UC should not be included in the measure of NEY. This appears to be a reasonable assumption for at least the initial qualification for benefits. Even if one assumes that once unemployed, the availability of benefits induces less effort to become re-employed, the budget constraint of the short-term unemployed person is identical to that of a longer-term unemployed who has an identical wage and lives in the same state. The difference in length of unemployment, therefore, must in this case be attributed to differences in tastes. Thus, UC benefits should not be included in NEY.[10]

Our treatment of workmen's compensation and veteran's disability and pensions program benefits is similar to that of public assistance and unemployment compensation benefits. We do not count WC or VD disabilities. Because the benefits are paid for the length of the disability, the benefit amount will normally be inversely correlated with time spent working. The inclusion of WC benefits in NEY would

lead to a spurious negative correlation in the NEY coefficient. Veteran's disability payments like WC payments are likely to be the best available proxy for the severity of a health limitation on work effort, while the veterans pension program is an income-tested program, which for our purposes is similar to the public assistance program. Thus, payments from either of these programs should not be counted in NEY.

Retirement pensions for those below age 65 pose another kind of holding-tastes-constant problem. Many individuals in the civil service, the military, and the private sector become eligible for retirement pensions well before the age of 65. To claim the pension, however, they must actually retire from their current job. If all individuals who were eligible did claim the benefits there would be no problem. But this is not the case. As of 1960, for example, 7.2 percent of civil service employees were composed of eligible retirees below the age of 65 who were not claiming their benefits.[11] One difference between claimants and nonclaimants who have identical alternative employment opportunities may be in their tastes for leisure vis-a-vis income.[12] In other words, the pensions of claimants may represent, at least in part, a proxy for taste. The ideal procedure would be to devise a method to correctly describe the opportunity loci of both claimants and nonclaimants eligible for pensions. But it would be very difficult to identify the nonclaimant eligibles, and even if this could be done easily, the introduction of alternative budget constraints would complicate the estimation problem. Moreover, eligibility for pensions may in part reflect taste differences. Some occupations like the military and the civil services offer relatively

generous pensions at an early age. Individuals who want to retire early are more likely to be attracted by such occupations. In order to reflect all these differences in taste, for male earners less than age 65 we use a dummy variable which is equal to 1 if the individual received a pension, and zero otherwise.[13] The amount of income received from a pension is counted in NEY.

Although individuals below age 62 cannot receive old age insurance payments, there may be other family members who receive either old age or survivor's insurance payments. Such payments should be counted in NEY.[14] However, if the male aged 25-61 whose labor supply we are examining could not work part or all of the year because of a health limitation, we presumed that any OASDI payments were disability payments. In this case, as with UC and WC benefits, we did not count OASDI payments in NEY. (The special treatment of OAI payments for those over age 61 is discussed in Section IIB.)

To summarize, we do not include benefits from public assistance, unemployment compensation, workmen's compensation or the veteran's programs in our measure of NEY. Our NEY variable is then the sum of the remaining elements of reported NEY in the SEO, or the sum of interest, dividends, rent, pensions, and social security payments to those without a disability problem and a miscellaneous category called other nonemployment income. Except for the miscellaneous category, which is not available, our ISR-OEO NEY measure is identical. In practice, most of the NEY for the prime age groups is attributable to interest, dividends, and rent. But even these may be indirectly related to the work effort of family members. Holding wage rates constant, labor supply will be positively related to annual earnings. As long as the rate of savings out of extra income is positive, larger earnings

will also lead to more assets and NEY. Individuals may work more than average either because they have a greater than average taste for income or a greater than average taste for work.

In addition, to using NEY, we can also use information on earnings of other family members to generate income-effect estimates. Unfortunately, however, in many cases the earnings of other family members will also depend indirectly on the labor supply of the individual. Since the labor supply of husbands and wives is jointly determined, the earnings of one may be negatively related to the labor supply of the other via a cross substitution effect. On the other hand, the earnings of one may be positively related to the other's labor supply because both may reflect the family's taste for income vis-a-vis leisure. These differences in taste may reflect either differences in tastes for lifetime income vis-a-vis lifetime leisure or differences in tastes for the timing of income and leisure. A priori, it is impossible to say which bias will dominate.

C. Wage Rate Measures

The hourly wage rate in the SEO is constructed by dividing normal weekly earnings by actual hours worked during the survey week. There are two major problems with this wage rate variable. First, it is missing for all individuals who did not work for wages during the survey week. Thus for demographic groups in which most members do not work, e.g., men age 72 or more, there is no measure of the actual hourly wage for large portions of the sample. Even for groups like prime age married men where almost everyone works, however, dividing <u>normal</u> earnings by <u>actual</u> hours worked may create serious measurement errors in the wage rate variable.[15] The hourly wage rate is too low for all individuals who worked more hours than their normal work week and too high for all individuals

who worked fewer hours than their normal work week. This kind of measurement error will normally bias the wage rate coefficient toward zero.[16]

A solution to both the missing wage rate and the measurement errors in wage rate problems is to use a two-stage least squares regression procedure. In a first stage, wage rates are regressed on a host of demographic variables such as education, race, health, age, and location. The coefficients of the independent variables are used to impute potential wage rates to individuals on the basis of their demographic characteristics. In the second stage labor supply regression, the imputed wage rate is used as the independent wage rate variable. The coefficient of the imputed wage rate variable may be unbiased[17] if the variables used to derive the imputed wage rate have no direct effect on the labor supply.

Unfortunately, the variables used to impute the wage rate are likely to have direct effects on labor supply. A brief examination of some of the variables used to estimate the imputed wage rate will make this clear. The first stage equation is as follows:

WR = WR (Age, Education; Race, Health Status, Current Location; Dummy for Foreign Location at Age Sixteen, Dummy for Union Membership.)

Health undoubtedly affects an individual's supply of labor independent of his wage rate. Age may be a good proxy for tastes and may also reflect demand factors. The demand for labor varies by race. Being black leads to both lower wages and lower availability of work. Education not only increases an individual's productivity but it may also change his tastes and affect the nonpecuniary aspects of jobs which an individual can get. It does not seem unreasonable to assume that those with more education are

most likely to have been socialized into a greater desire to work and that the more education an individual has the more pleasant his job is likely to be. Even more important, the number of years of education that an individual has completed may be the best proxy that we have for his ambition. That is, it is reasonable to assume that, on the average, individuals who drop out of school earlier than average will not only be less bright than average but less ambitious as well.

All of the variables discussed above have either positive direct effects on both the wage rate and labor supply or negative direct effects on both variables. Consequently, if they are excluded from the labor supply equation, the imputed wage variable will be biased upwards. On the other hand, if all the variables are included in the labor supply regression, there will be no independent variation in wage rates. Unfortunately, the attempt to use a potential wage variable inevitably leads to this "damned if you do and damned if you don't" bind. This is a very good reason for not using the imputed wage variable if a viable alternative exists. Because we have no choice for most of the groups discussed in this paper we are forced to rely almost exclusively upon the potential wage rate.

The ISR-OEO wage rate measure, however, is superior to that in the SEO. Individuals paid on an hourly basis were asked to report their hourly wage rate. The hourly wage rate for all other workers is constructed by dividing annual earnings by annual hours worked. Moreover, these measures are available for five years. Consequently, the reported wage rate, particularly the average of an individual's wage rate over five years, should be free from any serious pure measurement errors.[18] Thus,

the ISR-OEO study allows us to compare the results for at least 55-61 year old males when reported and potential wage rate measures are used.[19]

D. Functional Form

Although we experimented with numerous functional forms for both the income and wage rate variables in our prime age married male sample, we present results only from regressions in which we used linear nonemployment income and other earnings variables, and log linear reported wage rate and potential wage rate variables. There were two reasons for these choices. First, these functional forms generally provided the best fit. Second, the linear income and log linear wage rate coefficients are the easiest ones to convert into crude estimates of percentage reductions in labor supply which would result from NIT programs with specified guarantees and tax rates.[20]

E. Other Independent Variables

In addition to the income and wage rate variables, our SEO regressions for 55-61 year old males include the following independent variables:

(1) HPRELY = a dummy variable which is equal to one if health prevented the individual from working entirely the previous year.

(2) HLIMLY = a dummy variable equal to one if health prevented the individual from working part of the previous year.

(3) HPRE = a dummy variable equal to one if the individual has a long-term health disability which prevents him from working.

(4) HLIMA = a dummy variable equal to one if the individual has a long term health disability which limits the amount of work he can do.

(5) HLIMK = a dummy variable equal to one if the individual has a long-term health disability which limits the kind of work he can do.

(6) HLIMKA = a dummy variable equal to one if the individual has a long-term health disability which limits the kind and amount of work he can do.

(7) BLACK = a dummy variable which is equal to one if the individual's race is Negro.

(8) OTHRAC = a dummy variable which is equal to one if the individual's race is neither Causaian nor Negro.

(9) FAMSIZ = a set of dummy variables for family sizes of two, three, four, five, six, seven, or more.

(10) PENDUM = a dummy variable equal to one if the individual lived in an interview unit in which there was income from pensions but in which no one else was retired.

(11) NTWTH = family's total assets which bear no monetary return.

The health status variables overlap to some extent. The HPRELY, HPRE, HLIMA, HLIMK, AND HLIMKA variables are designed to measure long-term disabilities. The HLIMLY variable in contrast may reflect a long-term disability but it is more likely to reflect the effect of an episodic illness on labor supply the previous year. Unfortunately, there is no question in the SEO which can capture the influence of such an episodic illness on labor supply during the survey week.

The larger a family, the more income the family requires to maintain a given per capita standard of living. Assuming that tastes for standards of living do not vary with family size then, ceteris paribus, the larger the family, the more the head should work. This is the rationale for the inclusion of a set of family size dummies.

The PENDUM variable is used as a proxy for tastes. The rationale for its inclusion was discussed above. In Section II below we present NEY coefficients from one set of regressions in which the PENDUM variable was not included, and from another set of regressions in which separate NEY coefficients are estimated for pensioners and nonpensioners. The two racial variables are included to reflect any effects of discrimination on the demand side of the market.

Finally, while the NTWTH variable may be viewed as an alternative measure of the income effect on labor supply, for reasons discussed in footnote 6, the NTWTH coefficient is almost certain to be positively biased.

In our ISR-OEO regressions we use a comparable set of independent variables for 55-61 year old males. For other demographic groups in both data sets, we use slightly different sets of independent variables. Any changes in the set of other independent variables are described below in the pertinent sections.

F. Samples

A few groups of individuals were excluded from each of the demographic groups that we analyzed. In our SEO analysis, we excluded individuals serving in the Armed Forces either in the week previous to the SEO survey or during the previous year. The SEO measure of time employed consists of time employed as a civilian. In analyzing the SEO data, we also excluded individuals who reported that they did not work at all during the previous year due to institutionalization because, by definition, the labor supply of individuals who cannot work will be invariant with differences in wage rates and nonemployment income.

Finally, we excluded the self-employed from both the SEO and ISR-OEO studies because it is impossible to separate the returns to labor from the returns to capital for the self-employed. As a result, their wage rates and nonemployment income are likely to be mismeasured, and the wage rate and labor supply coefficients are likely to be biased.

From the ISR-OEO data we were unable to ascertain if individuals had been institutionalized. Moreover, it is not possible in the ISR-OEO study to identify members of the Armed Forces.

II. OLDER MEN

Because of the provisions of the Old Age Insurance (OAI) Program, compulsory retirement provisions, and social expectations, it is necessary to examine the labor supply of several different age groups of aged workers. The earnings test in the OAI program makes it difficult to obtain accurate income effect estimates and virtually impossible to obtain accurate substitution effect estimates for individuals age 62-71. (This problem is discussed in greater detail in Section IIB below.) In addition individuals age 62-64 are eligible for reduced OAI payments if they retire early. Due to compulsory retirement provisions the decision confronting many individuals 65 or older is whether or not to seek a new job rather than whether or not to work less at or quit an existing job. Finally, in large part because the OAI program sets the retirement age at 65, we believe that there is less social pressure to work for those who are approaching age 65 than for prime age males, virtually no social pressure to work for those who are 65 or more, and even some degree of social pressure for those who are

much older than 65 to not work. Given the above considerations we divided the aged into four age groups, those not eligible for OAI payments (55-61), those eligible for early retirement (63-64), those eligible for full OAI payments but subject to the earnings test (66-71) and those eligible for full OAI payments and not subject to the earnings test (73 and older).[21]

Because males age 55-61 are approaching the age where retirement is both respectable and encouraged, they are subjected to less social pressure to work than males age 25-54. As a consequence, we expect economic variables to be a more important determinant of the labor supply of the older group and thus the older group should have somewhat larger income and substitution elasticities. Because social pressures to work are even smaller for 63 and 64 year olds, we expect even larger income and substitution effects for this group, while these elasticities for the 66-71 year old males should be substantially larger because there are no social pressures to work. Finally, because health and social pressures become increasingly more important limitations on work for those over age 72, while the elasticities of labor supply for this group should be larger than those for prime age males, they are not likely to be as large as those for the 66-71 year old group.

We excluded all males who gave health limitations as the major cause for their not working at all from our 66-71 and 73 or more year old samples. For males over age 65, retirement is clearly a legitimate reason to give for not working. Including individuals in the sample who clearly cannot work will tend to bias the income and wage rate coefficients toward zero because while NEY and WR will vary among this group labor supply will

not. For males under age 65, however, retirement is not quite as legitimate. Thus there is a possibility that some retired males age 55-61 or 63-64 may claim that health prevented them from working; in fact, as reported in an earlier paper, we found that how much prime age unhealthy males worked was very sensitive to how much NEY they had and what their wage rates were. Consequently, we did not exclude such individuals from our 55-61 and 63-64 year old male samples.

As the figures in Table 1 indicate, those 55-61 work somewhat less than prime age males. After age 61 the labor supply of males declines dramatically with age. This reduction in the labor supply of males is undoubtedly due to some combination of reduced social pressure to work, reduced physical ability to work, reduced monetary rewards for work in the form of wage rates, and increased ability to afford not to work in the form of retirement benefits.

Note the large differences in the percent who work and in the mean values of OTHERN between the two samples of males age 73 or more. The SEO sample contains all males 73 or over while the ISR-OEO contains only those who are household heads. About 1/3 of the aged, live with their children. This group of the aged is much less likely to work than those who live by themselves. Because there is insufficient data on them this group is not included in the ISR-OEO sample.

For several reasons we expect the income and wage rate coefficients to be biased. The NEY coefficient is likely to be positively biased because it reflects the positive effect of economic ambition on both labor supply and NEY, and the positive savings effect of working more

TABLE 1

SEO Mean Values of Labor Supply and Income for Males Age 55-61, 63-64, 66-71, and 73+

	Married 55-61 (N = 1073)	Single 55-61 (N = 195)	63-64 (N = 280)	66-71 (N = 592)	73+ (N = 656)	Married 25-54 (N = 613)	Single 25-54 (N = 6263)
HLF_A	1748	1458	1289	548	165	1965	1791
$HEMP_A$	1694	1347	1206	516	161	1918	1168
$EMPDUM_A$	.89	.81	.73	.44	.17	.98	.98
$HWK_{SW} \leq 40$	30	24	21	8	2	35	31
HWK_{SW}	34	27	23	9	3	41	36
$WKDUM_{SW}$	.79	.65	.55	.26	.09	.91	.80
NEY	760	724	1052	1254	2782	300	313
WR	3.77	2.47	2.91	2.30	2.84	3.53	2.90
OTHERN	2306	1081	1761	1204	1418	1666	1057
OWN EARNINGS	6748	4155	4157	1507	417	7565	5562
TOTAL INCOME	9814	5960	6970	3965	4617	9531	6932

TABLE 1a

ISP-OEO Mean Values of Labor Supply

and Income Variables for Males Age 55-61, 73+

	Age 55-61 (N = 253)	Age 63-64 (N = 67)	Age 66-71 (N = 97)	Age 73 or Older (N = 141)
HWK_A	1751	1285	477	203
$HWK_A \leq 2000$	1569	1218	447	192
HLF_A-SEO_R	1589	1133	198	99
$EMPDUM_A$	.88	.75	.52	.28
NEY	1109	1456	2768	4193
WAGE RATE	4.32	4.04	3.08	1.91
OTHERN	2639	2303	733	466
OWN EARNINGS	8217	5125	1593	483
TOTAL INCOME	11965	8884	5094	5142

and earning more than average on NEY, as well as the negative effect of income on labor supply. The OTHERN coefficients may be positively biased because they reflect family tastes for income or negatively biased because they reflect a cross-substitution as well as an income effect.

The potential wage rate coefficients are likely to be positively biased because they reflect the positive effects of schooling, ambition and the nonpecuniary desireability of a job on labor supply as well as a positive substitution effect. On the other hand because so many of the aged not only do not work but would experience great difficulty in finding jobs which pay as well as their training would merit, it is likely that the potential wage rate is in many cases a poor proxy for what an individual could actually earn. This should bias the potential wage rate coefficient toward zero.

Such a high proportion of males over age 61 do not work that despite its shortcomings there is no alternative to the use of a potential wage rate. For the group 55-61, however, we also estimate a reported wage rate coefficient. On the one hand this coefficient will also be positively biased because it reflects the positive effects of ambition and the non-pecuniary desireability of a job, and the possibility of having to take a lower wage for part-time or part-year work. On the other hand, because the reported SEO wage rate is obtained by dividing normal weekly earnings by actual hours worked, the reported wage rate coefficients may be negatively biased in survey-week-hours regressions and biased toward zero in annual hours regressions.

A. Age 55-61

In Table 2 we present the NEY, OTHERN, LNPW, and LNWR coefficients from several regressions for the SEO and ISR-OEO 55-61 year old male samples. The income (based on NEY), wage rate and substitution elasticities derived from these coefficients are presented in Table 3 along with the comparable elasticities for prime age males.

Consider the SEO results first. All of the NEY coefficients in both the married and single samples are negative. Moreover, the coefficients in the single sample are uniformly larger in magnitude than those in the married sample. Yet while all the NEY coefficients in the married sample are statistically significant at .01 level or better, only one in the single sample is significant at the .05 level or better. The larger standard errors in the single sample may be due to smaller sample size--about 20 percent as large as the married sample. In contrast to the NEY coefficients, many of the OTHERN coefficients are positive, but more important none are significantly different from zero. In view of the fact that wives with retired husbands are also very likely to be retired, these results are not surprising.

The LNPW coefficients for married men are larger than those for single men. But the single LNWR coefficients are larger than the married LNWR coefficients. The latter pattern is what we expected to find--and did find--for both potential and reported wage rates for males age 25-54.

As expected, the income, wage rate, and substitution elasticities presented in Table 3 for married males age 55-61 are somewhat larger than those for the 25-54 age group. Similarly, the income, reported wage rate, and substitution (LNWR) elasticities for single men age 55-61 are larger

TABLE 2

SEO and ISR-OEO Income and Wage Rate Coefficients for
Married and Single Males Age 55-61

	Married								Single							
	NEY		OTHERN		LNPW		LNWR		NEY		OTHERN		LNPW		LNWR	
							SEO									
HLF_A	-.0228	(4.96)	-.00285	(0.8)	64	(2.30)	40	(1.80)	-.0469	(1.80)	+.0180	(0.9)	-6	(0.10)	107	(1.90)
$HEMP_A$	-.0206	(3.90)	-.00412	(1.0)	124	(3.90)	72	(2.80)	-.0324	(1.00)	+.0280	(1.3)	19	(0.40)	159	(2.50)
$EMPDUM_A$	-.00001	(5.50)	-.000002	(1.4)	.0043	(0.40)	.0019	(0.20)	-.00003	(2.90)			-.0090	(0.50)	.0056	(0.30)
$HWK_{SW} \leq 40 - U$	-.00064	(4.10)	+.00018	(1.5)	2.8	(3.00)	-1.5	(2.00)	-.00122	(1.70)	-.00006	(0.1)	1.1	(0.80)	2.3	(1.60)
$HWK_{SW} \leq 40$	-.00062	(3.80)	+.00016	(1.3)	4.3	(4.30)	-.5	(0.60)	-.00093	(1.20)	+.00002	(0.0)	1.5	(1.20)	3.2	(2.10)
$HWK_{SW} - U$	-.00061	(2.90)	+.00004	(0.3)	4.3	(3.30)	-3.5	(3.60)	-.00154	(1.70)	-.00040	(0.6)	1.9	(1.20)	-.7	(0.30)
HWK_{SW}	-.00057	(2.60)	+.00003	(0.2)	6.0	(4.60)	-2.3	(2.20)	-.00122	(1.30)	-.00031	(0.5)	2.5	(1.50)	.6	(0.30)
$WKDUM_{SW} - U$	-.00002	(3.90)	+.000004	(1.2)	.0665	(2.80)	.0045	(0.20)	-.00003	(1.50)	-.00002	(1.2)	.0461	(1.50)	.0686	(1.80)
$WKDUM_{SW}$	-.00001	(3.50)	+.000003	(1.1)	.1080	(4.50)	.0273	(1.40)	-.00002	(1.10)	-.00001	(0.8)	.0510	(1.60)	.0851	(2.20)
					ISR-OEO--Married and Single Combined											
HWK_A	-.0837	(3.6)	-.0212	(1.8)	86	(0.6)	-24	(0.3)								
$HWK_A \leq 2000$	-.0772	(4.5)	-.0036	(0.4)	113	(1.1)	47	(0.9)								
HLF_A-SEO_R	-.1066	(5.0)	-.0103	(0.9)	115	(0.9)	148	(2.2)								
$EMPDUM_A$	-.00003	(3.2)	+.000002	(0.3)	-.0066	(0.1)	-.0401	(1.4)								

TABLE 3

SEO, Income, Wage Rate, and Substitution Elasticities for Married and Single Males Age 55-61 and Age 25-54

	Married					Single				
	Income	Wage Rate (LNPW)	Wage Rate (LNWR)	Substitution (Using LNPW)	Substitution (Using LNWR)	Income	Wage Rate (LNPW)	Wage Rate (LNWR)	Substitution (Using LNPW)	Substitution (Using LNWR)
					Age 55-61					
HLF_A	-.12	.04	.02	.12	.10	-.17	.00	.07	.09	.16
$HEMP_A$	-.12	.07	.04	.15	.12	-.12	.01	.12	.07	.18
$EMPDUM_A$	-.12	.00	.00	.08	.08	-.23	.01	.01	.17	.17
$HWK_{SW} \leq 40 - U$	-.20	.09	-.05	.22	.08	-.32	.05	.10	.21	.26
$HWK_{SW} \leq 40$	-.19	.14	-.02	.27	.11	-.24	.06	.13	.18	.25
$HWK_{SW} - U$	-.17	.13	.10	.24	.21	-.29	.06	-.03	.21	.12
HWK_{SW}	-.16	.18	-.07	.29	.04	-.23	.07	.02	.19	.14
$WKDUM_{SW} - U$	-.19	.08	.01	.21	.14	-.26	.07	.11	.25	.20
$WKDUM_{SW}$	-.17	.14	.03	.25	.14	-.19	.08	.13	.21	.26
					Age 25-54					
HLF_A	-.06	.02	.01	.07	.06	-.12	.06	.06	.16	.16
$HEMP_A$	-.05	.05	.03	.09	.07	-.07	.17	.10	.23	.16
$EMPDUM_A$	-.04	.01	.00	.04	.03	-.02	.01	.01	.03	.03
$HWK_{SW} \leq 40 - U$	-.02	.05	-.04	.07	-.02	-.19	.10	-.04	.25	.11
$HWK_{SW} \leq 40$	.00	.09	-.03	.09	-.03	-.08	.20	.02	.26	.08
$HWK_{SW} - U$	.05	.01	-.16	-.03	-.20	-.02	.10	-.17	.12	-.15
HWK_{SW}	.05	.05	-.14	.01	-.19	.10	.19	-.12	.11	-.20
$WKDUM_{SW} - U$	.00	.04	.01	.04	.01	-.22	.07	-.01	.25	.16
$WKDUM_{SW}$	-.01	.07	.00	.06	.01	-.12	.16	.03	.26	.13

TABLE 3 (cont.)

Income, Wage Rate and Substitution Elasticities for ISR-OEO 55-61 and 25-54 Year Old Males

	Income	Wage Rate (LNPW)	Wage Rate (LNWR)	Substitution (Using LNPW)	Substitution (Using LNWR)
	Age 55-61 Married and Single Males				
HWK_A	-.57	.05	-.01	.44	.38
$HWK_A \leq 2000$	-.59	.07	.03	.48	.44
$HLF_A - SEO_R$	-.80	.07	.09	.64	.64
$EMPDUM_A$	-.41	-.01	-.05	.27	.23
	Age 25-54 Married Males*				
HWK_A	.00	.00	-.09	.00	-.09
$HWK_A \leq 2000$	-.10	.00	-.01	.07	.06
$HLF_A - SEO_R$	-.18	.00	.02	.13	.13
$EMPDUM_A$	-.13	.00	.00	.10	.09

*The elasticities for 25-54 year olds that are presented in this table are weighted elasticities of healthy and unhealthy prime age men.

than both those for married men age 55-61 and those for single men age 25-54. Only the potential wage rate elasticities for single men do not conform to our a priori expectations.

An unexpected result is that the income elasticities are substantially larger for the survey week measures of labor supply than for the annual measures of labor supply. One hypothesis to account for why older men have higher elasticities during the survey week than during the year while younger men do not is that older men with more than average NEY may be better able to afford to take their leisure in a southern climate during late winter or early spring--i.e., during the SEO survey week. The potential wage rate elasticities for married men and both the potential and reported wage rate elasticities for single men are also substantially more positive for the survey week than for the annual measures of labor supply. Why this differential exists is not clear. It may be something peculiar about the survey week--perhaps some seasonal pattern of demand.

Due to small sample size we had to combine 55-61 married and single men for the ISR-OEO analysis. The pattern of the ISR-OEO coefficients is similar to those from the SEO. The NEY coefficients are all negative and statistically significant but they are substantially larger than those in the SEO. The OTHERN coefficients like those in the SEO are all statistically insignificant. Although the t ratios are much smaller, the reported and potential wage rate coefficients are of similar magnitude to those in the SEO. The income and substitution elasticities for the ISR-OEO sample of older men are substantially larger than those for the ISR-OEO prime age samples. Most of the difference in the substitution elasticities is

attributable to the differences in income elasticities. (Note that while the older wage rate elasticities are generally more positive than those for younger males, the differences are small compared to those between the substitution elasticities of the young and old.) Not only are the ISR-OEO income elasticities larger than those for the younger males, but they are also four to five times larger than those for the SEO 55-61 year old samples.

Further Results: Pensioners and Unhealthy Subsamples

Most of the difference between the SEO and ISR-OEO income effect estimates is attributable to the much stronger income effects among pensioneers in the ISR-OEO sample. As explained in Section I, we expect pensioneers to have stronger income elasticities than nonpensioneers because of their presumed stronger tastes for leisure. In order to test this hypothesis we added a variable to our regressions, PENNEY which is the product of the pension dummy and NEY. We also added a variable PEN LNPW, the product of the pension dummy and the wage rate variable to our regressions. The coefficients of this variable were normally positive though statistically insignificant. Substitution elasticities of pensioneers calculated from these coefficients were, however, always larger than those of nonpensioneers.

In Table 4 we produce the NEY and PENNEY coefficients in several regressions from both data sources. The PENNEY coefficients measure the difference in the NEY coefficients between nonpensioneers and pensioneers. As expected in both samples the PENNEY coefficients are significantly more negative than the NEY coefficients. What was not

TABLE 4

NEY Coefficients for Non-Pensioneers and Pensioneers

	NEY		PENNEY	
		SEO		
HLF_A	-.0141	(2.9)	-.0559	(4.3)
$HEMP_A$	-.0117	(2.1)	-.0534	(3.6)
$EMPDUM_A$	-.000006	(3.1)	-.00002	(4.0)
$HWK_{SW} \leq 40$	-.00061	(3.4)	-.00009	(0.2)
HWK_{SW}	-.00053	(2.2)	-.00030	(0.5)
$WKDUM_{SW}$	-.00001	(3.3)	-.000003	(0.2)
		ISR-OEO		
HWK_A	-.0241	(0.8)	-.1319	(2.9)
$EMPDUM_A$	-.000001	(0.1)	-.00007	(3.8)

expected and is difficult to understand is the difference in magnitude between the total pensioneer NEY coefficients (NEY + PENNEY) in the two samples. The difference between the NEY coefficients for nonpensioneers in the two samples is not nearly so large; in fact the NEY coefficient in the SEO EMPDUM equation is actually larger than that in ISR-OEO EMPDUM equation: Thus the major source of difference in the income effects between the two samples is the unexplained large differences in income elasticities of pensioneers between the two samples. Perhaps in the 5 years between the SEO and ISR-OEO surveys, social morays have changed so that there is more legitimacy to early retirement. Or it may be that higher unemployment rates made it more difficult for pensioneers to secure new jobs in 1971 than in 1966.

Just as the labor supply of pensioneers is more elastic than that of nonpensioneers, we expected to find the labor supply of unhealthy labor males to be more elastic than that of healthy older males. For the most part, our expectations were confirmed, but frequently the differences were not statistically significant.

B. Age 63-64 and 66-71

As noted above, the existence of the earnings test complicates estimation of income and substitution effects for the group of old people age 62 through 71. Under the earnings test provisions in 1967, OAI benefits were reduced by 50¢ for each dollar earned per year in excess of $1600 and by $1 for each dollar earned in excess of $2800. Thus the amount of OAI payments that an individual receives depends in part on how much he works. Estimates of the effect of nonemployment income on

work effort, therefore, will also reflect the effect of work effort on the OAI part of nonemployment income. Unlike public assistance or unemployment insurance payments which affect only a small minority of the younger population and may, therefore, be ignored with (hopefully) not too much error, nearly all individuals age 62-71 are not only potentially eligible for Social Security payments, but also may be expected to consciously make work decisions on the basis of their potential payments. Consequently, simply excluding OAI benefits from nonemployment income is not a tenable solution to this simultaneity problem.

The solution that we adopted was to obtain an estimate of the amount of OAI benefits that the individual would have been entitled to if he were completely retired. This estimate was obtained in much the same way that our potential wage rate estimates were obtained. OAI payments for males age 63 or more with positive OAI payments who did not work at all were regressed on age, race, years of schooling, location, and marital status. The coefficients of these variables were then used to assign all individuals in the 63 or 71 age bracket a potential OAI payment. Potential OAI payment was then entered as a variable in the regression and actual OAI payments were not counted in NEY. This procedure enables us to obtain an estimate for the income effect of potential Social Security payments as well as an income effect from nonemployment income.

The problem of estimating an accurate wage rate and substitution effect which is created by the existence of the earnings tests is more intractable because the earnings test creates a nonlinear segmented budget constraint. As a consequence, while we include a potential wage

rate variable in our equations and report the coefficients below, we do not use these coefficients to calculate wage rate and substitution elasticities.

One other problem is how to handle the pensioneer issue. As noted above, the rationale for including a pension dummy variable is that many individuals who are eligible for pensions do not claim them because doing so requires giving up the job where pension entitlement was accrued. Because the percent of prime age males who claim pensions to which they are entitled is small, it is reasonable to assume that on average those who do claim pensions have stronger than average preferences for leisure. The same argument applies to individuals age 55-61 and to a lesser extent to 63 and 64 year olds. But, by age 65, having a pension is not so unusual and cannot be interpreted as evidence of greater than average tastes for leisure. While 6 percent and 13 percent of the SEO and ISR-OEO 55-61 year old samples have pensions, and 15 percent and 25 percent of the 63-64 have pensions, 39 percent and 51 percent of the 66-71 year old samples have pensions. For all age groups the inclusion of the pension dummy could lead to an underestimate of the income effect. While we believe that for those below age 65, the exclusion of the pension dummy variable will lead to a more serious overestimate of the income effect, the grounds for believing this for the 66-71 year old group are weak. Thus although we present NEY results for both age groups from regressions with and without a pension dummy, for the 63-64 year old group we believe the income effect derived from a regression with the pension dummy is the best estimate while the opposite is the case for the 66-71 year old group.

In Table 5 below we present the OTHERN, LNPW, and two sets of NEY coefficients from regressions for the SEO and ISR-OEO 63-64 and 66-71 year old samples. The independent variables are the same as for the 55-61 year old group except that a variable for potential OAI payments is included in all regressions. (The coefficients of this variable are presented in Table 7 and discussed below.) In Table 6, the income elasticities derived from the two sets of NEY coefficients are presented.

As expected, all of the NEY coefficients for both age groups are negative and most are statistically significant. Those taken from regression without the pension dummy are on average about twice as large as those taken from regressions with a pension dummy. In contrast to the NEY coefficients with the exception of the ISR-OEO 63-64 year old sample, all of the OTHERN coefficients are positive. Because retirement decisions in a family are likely to be joint ones, i.e., both partners retire, the positive OTHERN coefficients are not too surprising. We are at a loss, however, to explain the negative coefficients for the 63-64 year old ISR-OEO sample.

With one exception, the potential wage rate coefficients are all positive. About half of them are statistically significant at the .05 level. While a positive relationship was expected, as explained above, it is difficult to attach much meaning to the magnitude of the coefficients. Once more, however, the results for the 63-64 year old ISR-OEO sample stand out. The potential wage rate coefficients for this sample are six to nine times larger than the comparable coefficients for the SEO 63-64 year old sample. They are also that much larger than the SEO and ISR-OEO 66-71 year old samples. As with the OTHERN coefficients we have no explanation for these findings.

TABLE 5

SEO and ISR-OEO Income and Wage Rate Coefficients for
63-64 and 66-71 Year Old Males

	63-64 Year Olds				66-71 Year Olds			
	NEY With Pension Dummy	NEY Without Pension Dummy	OTHERN	LNPW	NEY With Pension Dummy	NEY Without Pension Dummy	OTHERN	LNPW
				SEO				
HLF_A	-.0183 (3.1)	-.0224 (3.9)	+.0069 (0.4)	95 (1.2)	-.0357 (2.0)	-.0896 (5.4)	+.0274 (2.0)	143 (3.6)
$HEMP_A$	-.0177 (2.9)	-.0215 (3.4)	+.0070 (0.4)	117 (1.4)	-.0333 (1.9)	-.0852 (5.3)	+.0279 (2.1)	135 (3.5)
$EMPDUM_A$	-.00001 (3.4)	-.00001 (3.9)	-.00001 (0.6)	.0475 (1.2)	-.00004 (3.4)	-.00006 (6.3)	+.00001 (1.4)	+.0818 (3.4)
$HWK_{SW} \leq 40$	-.00029 (2.0)	-.00034 (2.3)	-.00029 (2.0)	1.5 (0.8)	-.00028 (0.8)	-.00107 (3.4)	+.00070 (2.6)	1.7 (2.3)
HWK_{SW}	-.00032 (1.8)	-.00036 (2.0)	-.00029 (0.5)	1.9 (0.8)	-.00025 (0.6)	-.00125 (3.2)	+.00082 (2.5)	+1.4 (1.5)
$WKDUM_{SW}$	-.00001 (2.0)	-.00001 (2.4)	-.00004 (0.4)	.0364 (0.7)	-.00001 (1.1)	-.00003 (3.3)	+.00002 (2.3)	.0554 (2.4)
				ISR-OEO				
HWK_A	-.0561 (1.2)	-.1972 (4.5)	-.0784 (3.3)	701 (2.4)	-.0615 (2.4)	-.0782 (3.6)	+.0210 (0.5)	133 (0.7)
$HWK_A \leq 2000$	-.0675 (1.6)	-.1924 (4.9)	-.0688 (3.3)	650 (2.6)	-.0536 (2.4)	-.0701 (3.6)	-.0016 (0.0)	97 (0.6)
HLF_A-SEO_R	-.0858 (1.6)	-.2006 (4.4)	-.1029 (3.8)	1015 (3.1)	-.0313 (1.6)	-.0492 (2.9)	+.0164 (0.5)	-36 (0.2)
$EMPDUM_A$	-.00005 (1.9)	-.00011 (4.8)	-.00002 (1.9)	.3413 (2.2)	-.000007 (0.4)	-.00003 (1.8)	+.00003 (1.0)	.0079 (0.1)

Note: The OTHERN, and LNPW coefficients for the 63-64 year old samples are taken from regressions which include the pension dummy variable while those for the 66-71 year old samples are taken from regressions which do not include this variable. The inclusion or exclusion of the pension dummy variable, however, had little effect on the OTHERN and LNPW coefficients.

TABLE 6

SEO and ISR-OEO Income Elasticities for
63-64 and 66-71 Year Old Males

	63-64 Year Olds		66-71 Year Olds	
	With Pension Dummy	Without Pension Dummy	With Pension Dummy	Without Pension Dummy
		SEO		
HLF_A	-.10	-.12	-.26	-.65
$HEMP_A$	-.10	-.12	-.26	-.65
$EMPDUM_A$	-.10	-.10	-.36	-.54
$HWK_A \leq 40$	-.10	-.11	-.14	-.53
HWK_{SW}	-.10	-.11	-.11	-.55
$WKDUM_{SW}$	-.13	-.13	-.15	-.46
		ISR-OEO		
HWK_A	-.39	-1.36	-.66	-.84
$HWK_A \leq 2000$	-.49	-1.40	-.61	-.80
$HLF_A - SEO_R$	-.67	-1.57	-.81	-1.27
$EMPDUM_A$	-.59	-1.30	-.07	-.29

TABLE 7

Potential OAI Coefficients for SEO and ISR-OEO 63-64 and 66-71 Year Old Male Samples

	SEO			ISR-OEO		
	63-64		66-71		63-64	66-71
HLF_A	+.4631	(2.3)	-.0777 (0.5)	HWK_A	+.3430 (2.4)	-.3490 (2.2)
$HEMP_A$	+.5327	(2.6)	-.0248 (0.2)	$HWK_A \leq 2000$	+.2685 (2.1)	-.2902 (2.1)
$EMPDUM_A$	+.00006	(0.6)	-.00018 (1.9)	$HLF_A D\text{-}SEO_R$	+.3374 (2.1)	-.3553 (2.9)
				EMPDUM	+.00009 (1.1)	-.00003 (0.2)
$HWK_{SW} \leq 40$	+.0185	(3.7)	+.00177 (0.6)			
HWK_{SW}	+.0189	(3.1)	+.00169 (0.5)			
$WKDUM_{SW}$	+.00037	(2.9)	+.00004 (0.4)			

Note: The potential OAI coefficients for the 63-64 year old samples are taken from regressions which include the pension dummy variable while those for the 66-71 year old groups are taken from regressions without this variable. The inclusion or exclusion of the pension dummy variable, however, had little effect on the OAI coefficients.

The income elasticities presented in Table 6 are about as predicted. The elasticities for SEO 66-71 year olds are much higher than those for SEO 63-64 year olds. If one assumes as we do that it is appropriate to include the pension dummy for the 63-64 year old age group but inappropriate for the 66-71 year old group, the ISR-OEO results are as clearcut as those for the SEO, i.e., 66-71 year olds have higher income elasticities.

The Effects of Potential OAI

The potential OAI payments coefficients for the four samples of older males are presented in Table 7. Perhaps the most interesting aspect of the results is that while the coefficients are as expected uniformly negative for the 66-71 year old age group, they are uniformly positive for the 63-64 year old age group. Recall that a worker who retires before age 65 has his OAI benefit permanently reduced by 5/9 of 1 percent for each month of the difference between his age when he receives his first benefit and when he reaches 65. As a result for the 63-64 year old age group, the potential OAI coefficient does not represent a pure income effect. The higher are potential OAI payments, the larger is the absolute cost in terms of foregone future OAI payments of retiring early. Moreover, those with higher potential OAI payments on average are also likely to be more healthy, have longer expected lifetimes, and have better employment prospects than those with lower potential OAI payments. All of these factors would lead to the positive relationship between potential OAI payments and labor supply that we found.

While the potential OAI payment coefficients in the SEO 66-71 year old group are similar in magnitude to the NEY coefficients, the coefficients

in the ISR-OEO sample are about three or four times larger than the comparable NEY coefficients. This result is puzzling.

C. Age 73 or More

In Table 8 we present the NEY, OTHERN, and LNPW coefficients for males 73 or more from both samples.

The most striking aspect of the results is the complete lack of statistical significance. In view of the very small percentage of aged individuals who work, and the large role that the availability of a job plays in whether the aged work, this is not surprising.

Despite the lack of statistical significance, as Table 9 shows, the point estimates of the income and substitution elasticities[23] for this age group are somewhat larger than those for prime age males. These results, therefore, appear to confirm the hypothesis that because there are no social pressures for the aged to work, their labor supply schedules should be more income and price elastic than those of younger men. Moreover, the elasticities for those 73 years old more more tend to be smaller th hose for the 66-71 year old group supporting the hypothesis that health limitations and some institutional social pressures not to work, would lead to somewhat lower elasticities for this age group.

III. OLDER WOMEN

While existence of the Old Age Insurance system complicates the estimation of income elasticities for males age 63-71, it makes it virtually impossible to estimate income elasticities for women in this

TABLE 8

Income and Wage Rate Coefficients for
Males Age 73 or More

Labor Supply Measure	NEY		OTHERN		LNPW	
			SEO			
HLF_A	-.0104	(1.4)	+.0060	(0.8)	9.8	(0.3)
$HEMP_A$	-.0096	(1.3)	+.0054	(0.7)	11.4	(0.4)
$EMPDUM_A$	-.000010	(1.7)	+.00001	(0.9)	-.0036	(0.0)
$HWK_{SW} \leq 40$	-.00011	(0.8)	+.00010	(0.7)	0.5	(0.8)
HWK_{SW}	-.00023	(1.1)	+.00004	(0.2)	1.70	(1.9)
$WKDUM_{SW}$	-.000004	(0.8)	+.00000	(0.1)	.0232	(1.1)
			ISR-OEO			
HWK_A	-.0289	(1.9)	+.0280	(1.0)	32	(0.6)
$HWK_A \leq 2000$	-.0249	(1.9)	+.0149	(0.6)	28	(0.6)
$HLF_A - SEO_R$	-.0213	(1.7)	+.0090	(0.4)	31	(0.7)
$EMPDUM_A$	-.00002	(1.3)	-.0001	(0.4)	-.0564	(1.2)

TABLE 9a

Income Wage Rate and Substitution Elasticities for SEO 55-61, 63-64, 66-71 and 73 or More Year Old Male Samples

	Age 73 or More			Age 63-64	Age 66-71
	Income	Wage Rate (LNPW)	Substitution	Income	Income
HLF_A	-.29	.06	.09	-.10	-.65
$HEMP_A$	-.28	.07	.10	-.10	-.65
$EMPDUM_A$	-.27	-.02	.00	-.10	-.54
$HWK_{SW} \leq 40$	-.25	.25	.27	-.10	-.53
HWK_{SW}	-.35	.57	.60	-.10	-.55
$WKDUM_{SW}$	-.21	.26	.28	-.13	-.46

	Age 55-61					
	Married			Single		
	Income	Wage Rate (LNPW)	Substitution	Income	Wage Rate (LNPW)	Substitution
HLF_A	-.12	.04	.12	-.17	.00	.09
$HEMP_A$	-.12	.07	.15	-.12	.01	.07
$EMPDUM_A$	-.12	.00	.08	-.23	.01	.17
$HWK_{SW} \leq 40$	-.19	.14	.27	-.24	.06	.18
HWK_{SW}	-.16	.18	.29	-.23	.07	.19
$WKDUM_{SW}$	-.17	.14	.03	-.19	.08	.21

Note: The income elasticities reported for the 55-61 and 63-64 year olds are taken from regressions which contain a pension dummy variable, while those for 66-71 and 73 year olds are taken from regressions which do not contain this variable.

TABLE 9b

Income, Wage Rate and Substitution Elasticities for ISR-OEO 55-61, 63-64, 66-71 and 73 or More Year Old Male Samples

	Age 73 or More				
	Income	Wage Rate (LNPW)	Substitution	Age 63-64 Income	Age 66-71 Income
HWK_A	-.73	.00	.07	-.39	-.82
HWK_A ≤2000	-.67	.00	.06	-.49	-.79
HLF_A-SEO_R	-1.10	.00	.10	-.67	-1.20
$EMPDUM_A$	-.37	.00	.03	-.59	-.30

	Age 55-61		
	Income	Wage Rate (LNPW)	Substitution
HWK_A	-.57	.05	.44
HWK_A ≤2000	-.59	.07	.48
HLF_A-SEO_R	-.80	.07	.64
$EMPDUM_A$	-.41	-.01	.27

age group. Because almost all men work, it is reasonable to assume that all men age 63-71 are eligible for OAI payments. But such an assumption is untenable for women, particularly married women. Most married women obtain OAI benefits only as dependents of their retired spouses. But others obtain entitlement on their own work record. Thus how much OAI benefits a women is entitled to depends not only on her current work status but as well upon her previous work status and the work status of her husband. Obtaining accurate estimates of potential OAI benefits for this age group is, therefore, nearly impossible. While we could generate income estimates from coefficients for husband's earnings, a large number of wives in this age group have husbands who are retired, thus such results could not be applied with any confidence to all those 63-71.

Because women are not subject to social pressures to work, economic considerations should play a larger role in the labor supply decisions of women than of men. Consequently, we expect women age 55-61 and 73 or more to have larger income and substitution elasticities than men age 55-61 and men age 63-64. But the labor supply elasticities of men past retirement age should be as large as those of women because these men are also not expected to work. Finally, we expect the magnitude of the older women's labor supply elasticities to be roughly comparable to that of younger women without children because about 90 percent of women in this older age group do not have any children who are living at home. While there may be differences in tastes for market work by cohort and/or age, we do not expect such differences to be very dramatic.

A comparison of the mean values of older women's labor supply which are presented in Table 10 with the means for older men which are presented

TABLE 10

Mean Values of Female Labor Supply and Income for the SEO and ISR-OEO 55-61 and 73 or More Year Old Samples

	SEO			ISR-OEO		
	Age 55-61		Age 73 or More Married and Single (N=950)		Age 55-61 Married Women (N=200)	Age 73 or More Married and Single (N=170)
	Married (N=976)	Single (N=395)				
HLF_A	707	1357	58	HWK_A	667	35
$HEMP_A$	683	1301	54	$EMPDUM_A$	.48	.09
$EMPDUM_A$	.48	.78	.06			
$HWK_{SW} \leq 40$	11	25	1.1			
HWK_{SW}	12	27	1.5			
$WKDUM_{SW}$	.35	.69	.044			
NEY	1195	769	1992	NEY	1609	3210
WR	2.04	2.02	.84	WR	2.80	1.67
OTHERN	6891	1582	2309	OTHERN	8028	379
OWN EARNINGS	1231	2740	91	OWN EARNINGS	1868	59
TOTAL INCOME	9317	5091	4392	TOTAL INCOME	11504	3648

in Table 1 indicates that older women do work substantially less than older men. Part of this difference is undoubtedly due to different role expectations, but part of the difference may also be due to income and substitution effects--i.e., larger NEY and lower wage rates for women.

A. Married Women Age 55-61

In Table 11, we present the NEY, OTHERN, and LNPW coefficients from several regressions for the SEO and ISR-OEO 55-61 married women samples. The other independent variables in the regressions are the same as those for males except for the addition of two dummy variables to indicate the presence of children less than and older than 13 years of age. The income, wage rate and substitution elasticities derived from the NEY, OTHERN, and LNPW coefficients, along with comparable elasticities for prime age married women and 55-61 year old married men are presented in Table 12.

All of the coefficients in the SEO sample have the expected sign and are highly significant. While only two of the ISR-OEO coefficients are statistically significant at the .05 level, they all have the expected sign and are generally comparable in magnitude to the SEO coefficients. The differences in statistical significance are, therefore, probably attributable to the differences in sample size.

With two exceptions, the elasticities for 55-61 and 25-54 year old married women are comparable in magnitude. One exception is that the wage rate and substitution elasticities for the ISR-OEO 55-61 year olds are quite a bit larger than those for the ISR-OEO 25-54 year olds and those for SEO 55-61 year olds which are based on the annual measures of labor supply. While we have no explanation for this difference, we do

TABLE 11

NEY, HE, and LNPW Coefficients
for 55-61 Year Old Married Women

Labor Supply Measure	HE	NEY	LNPW
	SEO		
HLF_A	-.0273 (5.0)	-.0468 (4.1)	245 (3.0)
$HEMP_A$	-.0263 (4.9)	-.0444 (4.0)	253 (3.2)
$EMPDUM_A$	-.00001 (4.4)	-.00003 (4.0)	.078 (1.7)
$HWK_{SW} \leq 40$	-.00043 (4.1)	-.00077 (3.6)	9.7 (3.7)
HWK_{SW}	-.00047 (4.0)	-.00085 (3.5)	11.5 (6.6)
$WKDUM_{SW}$	-.00001 (4.1)	-.00002 (3.8)	.227 (5.2)
	ISR-OEO		
HWK_A	-.0283 (2.3)	-.0367 (1.2)	500 (1.8)
$EMPDUM_A$	-.00001 (1.8)	-.00004 (2.1)	.2644 (1.6)

TABLE 12

Income, Wage Rate, and Substitution Elasticities for 55-61 and 25-54 Year Old Married Women and 55-61 Year Old Married Men

Labor Supply Measure	Married Women								55-61 Year Old Married Men		
	55-61 Year Olds				25-54 Year Olds						
	Income		Wage		Income		Wage		Income	Wage Rate	Substitution
	HE	NEY	Rate	Substitution[a]	HE	NEY	Rate	Substitution[a]	NEY	LNPW	Using LNPW
						SEO					
HLF_A	-.36	-.62	.35	.40	-.44	-.22	.43	.49	-.12	.04	.12
$HEMP_A$	-.36	-.61	.37	.42	-.44	-.20	.47	.52	-.12	.07	.15
$EMPDUM_A$	-.27	-.52	.16	.20	-.33	-.18	.30	.35	-.12	.00	.08
$HWK_{SW} \leq 40$	-.36	-.64	.86	.91	-.45	-.23	.66	.72	-.19	.14	.27
HWK_{SW}	-.37	-.67	.96	1.01	-.45	-.25	.67	.73	-.16	.18	.29
$WKDUM_{SW}$	-.32	-.63	.66	.70	-.41	-.22	.64	.70	-.17	.14	.25
						ISR-OEO					
HWK_A	-.49	-.63	.75	.83	-.41	-.09	.39	.51	-.57	.05	.44
$EMPDUM_A$	-.24	-.96	.55	.59	-.25	-.05	.37	.42	-.41	-.01	.27

[a]The income elasticities derived from the HE coefficients were used to calculate the substitution elasticities.

have an explanation for why the income elasticities derived from the NEY coefficients are substantially larger in the 55-61 year old group. We hypothesized that in older families with sufficient nonemployment income for the husband to retire, retirement for the husband would normally entail retirement for the wife as well. If this were so the NEY coefficient in the 55-61 year old married women sample would be too negative because it reflects a joint retirement as well as pure income effect. In order to test this hypothesis, we estimated separate NEY and HE coefficients for women from families where the husband worked respectively greater than and less than 26 weeks. This hypothesis appears to be supported by the finding that the NEY coefficients for wives with husbands who worked more than 26 weeks was much smaller than those reported in Table 10; in fact they were virtually identical to the HE coefficients reported in that table.

As expected, the labor supply elasticities for 55-61 year old married women are with one exception substantially larger than those for 55-61 year old married men. The single exception is the set of income elasticities in the ISR-OEO data. But as noted above in Section II, the ISR-OEO income elasticities for 55-61 year old males are extremely high because of the unexplainably large elasticities for pensioneers.

Finally, note that the SEO wage rate and substitution elasticities for the survey week measures of labor supply are quite a bit larger than those for the annual measures of labor supply. The same differences appear for prime age women. At this point, we do not have a satisfactory explanation for this finding.

B. Single Women Age 55-61

In Table 13 we present the NEY and LNPW coefficients from several regressions for the SEO sample of single women age 55-61. (The ISR-OEO sample was too small to analyze.) The other independent variables in the regression are the same as those used for males. In Table 14 we present the income, wage rate, and substitution elasticities derived from the NEY and LNPW coefficients, along with comparable elasticities for 55-61 year old married women and single men.

All of the coefficients have the expected sign and are highly significant. As expected, the labor supply elasticities of single women age 55-61 are substantially larger than those for single men of same age. Except for the income elasticities, the wage and substitution elasticities are comparable in magnitude to those for 25-54 year old single women, and not too different from those for married women, ages 55-61. We are not sure why the income elasticity estimates increase with age for single women, especially for the annual results, while there is no comparable increase for married women. Perhaps major reductions in labor supply are often closely associated with changing location (e.g., to warmer climates) and single women can make a decision on such a move (either permanently or temporarily) with much less constraints than can a married woman.

C. Women Age 73 or More

In Table 15, we present the NEY, OTHERN, and LNPW coefficients from several regressions for the SEO and ISR-OEO samples of women over age 72. (The other independent variables in the regressions are the same as those

TABLE 13

NEY and LNPW Coefficients for SEO
55-61 Year Old Single Women

Labor Supply Measure	NEY		LNPW	
HLF_A	-.205	(6.3)	363	(3.9)
$HEMP_A$	-.198	(6.0)	406	(4.3)
$EMPDUM_A$	-.00011	(6.8)	.114	(2.5)
$HWK_{SW} \leq 40$	-.00306	(4.2)	7.0	(3.3)
HWK_{SW}	-.00329	(3.5)	7.3	(2.7)
$WKDUM_{SW}$	-.00008	(4.4)	.196	(3.6)

TABLE 14

Income, Wage Rate and Substitution Elasticities for SEO 55-61 Year Old Single Women, Married Women and Single Men and 25-54 Year Old Single Women

	Age 55-61									Age 25-54 Single Women		
	Single Women			Married Women			Single Men					
Labor Supply Measure	Income	Wage Rate	Substitution	Income	Wage Rate	Substitution	Income	Wage Rate	Substitution	Income	Wage Rate	Substitution
HLF_A	-.77	.27	.69	-.36	.35	.40	-.12	.06	.16	-.37	.29	.49
$HEMP_A$	-.78	.31	.73	-.36	.37	.42	-.07	.17	.23	-.38	.31	.51
$EMPDUM_A$	-.56	.15	.45	-.27	.16	.20	-.02	.01	.03	-.33	.18	.36
$HWK_{SW} \leq 40$	-.63	.28	.62	-.36	.86	.91	-.08	.20	.26	-.50	.34	.61
HWK_{SW}	-.61	.27	.60	-.37	.96	1.01	+.10	.19	.11	-.61	.38	.71
$WKDUM_{SW}$	-.60	.29	.61	-.32	.66	.70	-.12	.16	.26	-.45	.33	.57

TABLE 15

Income and Wage Rate Coefficients for 73 or More Year Old Women

Labor Supply Measure	OTHERN	NEY	LNPW
		SEO	
HLF_A	-.00223 (0.8)	-.00339 (0.8)	1.7 (0.3)
$HEMP_A$	-.00185 (0.7)	-.00232 (0.5)	1.9 (0.3)
$EMPDUM_A$	-.000002 (1.0)	+.000001 (0.1)	-.00036 (0.1)
$HWK_{SW} \leq 40$	-.00004 (0.7)	-.00007 (0.7)	.0661 (0.3)
HWK_{SW}	-.00007 (0.7)	-.00015 (0.9)	.0459 (0.3)
$WKDUM_{SW}$	-.000002 (0.8)	-.000002 (0.5)	-.00387 (0.8)
		ISR-OEO	
HWK_A	+.00928 (1.1)	-.00343 (0.8)	3.3 (0.3)
$EMPDUM_A$	-.000005 (3.4)	-.000005 (0.7)	.01806 (1.0)

used for males of the same age.) In Table 16, we present the income wage rate, and substitution elasticities derived from the coefficients reported in Table 15 along with comparable elasticities for men 66-71 and over age 72 and for women 55-61.

As with men over age 72, none of the coefficients in the sample of women over age 72 is significantly different from zero. Most of the coefficients, however, have the expected signs. And as the figures in Table 16 indicate, the point elasticity estimates for men and women over age 73 are not too different; in fact the male elasticities are generally larger than those for females. Thus our hypothesis that the labor supply elasticities of women over age 65 should not be any larger than those of men over age 65 because there are no differences by sex in social pressures to work at this age appears to be supported by the data. Further confirmation for this hypothesis is provided by comparing the income elasticities for men 66-71 to women 55-61. The two sets are quite close to one another in magnitude.

The lower elasticities for women over age 73 than for women 55-61 is also not too surprising. A similar pattern holds for in comparing men over 73 with those 66-71. As argued above, the lower elasticities are to be expected because of social institutional, and health pressures which strongly mitigate work for those over age 72.

IV. CONCLUSION

In this paper we presented estimates of income, wage rate, and substitution elasticities for several groups of older men and women. For the

TABLE 16

Income, Wage Rate, and Substitution Elasticities for 73 or More Year Old Women and Men and 55-61 Year Old Women

	73 Year Olds							55-61 Year Old Women							66-71 Year Old Men
	Women				Men			Married				Single			
Labor Supply Measure	Income OTHERN	Income NEY	Wage Rate	Substitution	Income	Wage Rate	Substitution	Income HE	Income NEY	Wage Rate	Substitution	Income	Wage Rate	Substitution	Income
				SEO											
HLF_A	-.17	-.26	.03	.03	-.29	.06	.09	-.36	-.62	.35	.40	-.77	.27	.69	-.65
$HEMP_A$	-.15	-.19	.04	.04	-.28	.07	.10	-.36	-.61	.37	.42	-.78	.31	.73	-.65
$EMPDUM_A$	-.14	+.07	.00	.00	-.27	-.02	.00	-.27	-.52	.16	.20	-.56	.15	.45	-.54
$HWK_{SW} \leq 0$	-.16	-.28	.06	.06	-.25	.25	.27	-.36	-.64	.86	.91	-.63	.28	.62	-.53
HWK_{SW}	-.20	-.44	.03	.03	-.35	.57	.60	-.37	-.67	.96	1.01	-.61	.27	.60	-.55
$WKDUM_{SW}$	-.20	-.20	-.09	-.09	-.21	.26	.28	-.32	-.63	.66	.70	-.60	.29	.61	-.46

	73 Year Olds							55-61 Year Old Married Women				66-71 Year Old Men
	Women				Men							
Labor Supply Measure	Income OTHERN	Income NEY	Wage Rate	Substitution	Income	Wage Rate	Substitution	Income HE	Income NEY	Wage Rate	Substitution	Income
				ISR-OEO								
HWK_A	-.36	+.97	.09	.07	-.73	.00	.07	-.49	-.63	.75	.83	-.84
$EMPDUM_A$	-.20	-.20	.20	.20	-.37	.00	.03	-.24	-.96	.55	.59	-.29

most part, the results are consistent with a priori expectations. In general the income effects are negative and the substitution effects are positive. As expected, the elasticities for older men and women are larger than those for prime age married males. While the labor supply elasticities of men below retirement age are smaller than those for women, the labor supply elasticities of men over age 65 are generally just as large as those for women.

FOOTNOTES

[1]Economic theory assumes that an individual's choice between work and leisure (or other nonwork activites) depends on his net wage rate and his nonwage income. Since, other things being equal, the individual is assumed to prefer leisure to work, an increase in his nonwage income will lead him to work less and "consume" more leisure. In other words, there is a negative income effect on labor supply.

A change in the net wage will have a similar income effect on labor supply. However, there will also be a positive substitution effect in this case since an increase in the net wage means that each hour of leisure is now more expensive. Thus an increase in the wage may lead to either an increase or a decrease in the supply of labor depending on whether the substitution or income effect dominates.

Income transfer programs involve a guarantee, G, the amount of income a given individual or family will receive if they have no other income and a marginal tax rate, r, the rate at which the income support decreases as the family's earnings and other sources of income increase. Income maintenance programs not only increase the beneficiary family's nonwage income, but, if the marginal tax rate is positive, also reduce the net wage of each family member. Thus both the total income effect and the substitution effect will act to reduce the family's work effort.

Some income transfer programs have a zero guarantee and a negative marginal tax rate. These earnings or wage subsidy programs could lead to either increases or decreases in labor supply because while they increase income, they also increase the cost of leisure by increasing net wage rates.

[2]The result reported in this paper will constitute a major part of our forthcoming monograph on The Labor Supply Effects of Income Maintenance Programs.

[3]If we take too aggregative an approach, we not only loss interesting information but we may also bias our estimates of the labor supply effects of income transfer programs. For example, if subgroups with lower average labor supply have higher elasticities, then aggregate results will overestimate labor supply reductions as a result of introducing a new or more generous program.

[4]We use only the 1967 SEO data because only part of the 1966 sample was re-interviewed in 1967 and the 1967 questionnaire is superior in a number of ways, the most important of which is that an hourly wage rate variable is available for 1967 but not for 1966. We use the self-weighting sample only because it is sufficiently large to make reliance on the oversampled poor part of the sample unnecessary. Moreover, we have some qualms

4 (cont.) about using the supplementary subsample because we believe that the way the sample was chosen may introduce some biases into our results. While it is possible to weight the total sample in such a fashion that it corresponds to the self-weighting sample, there is not a one-for-one correspondence between the method of selecting the supplementary subsample and the method of assigning the weights. In the ISR-OEO data we made use of the supplementary subsample because the self-weighting sample size was so much smaller than that in the SEO. In future work, however, we will use the total SEO sample and the self-weighting ISR-OEO sample to test how sensitive our results are to this sample selection problem.

[5]The survey week took place in early spring. Unemployment is generally higher than average in this period.

[6]The following information on the family's asset position is available in the SEO: (1) market value and mortgage or other debt of farms, businesses or professional practices, (2) market value and debt of real estate, (3) market value and debt of own home, (4) money in checking, savings accounts, or any place else, (5) stocks, bonds, and personal loans and mortgages, (6) market value and debt of motor vehicles, (7) other assets (excluding personal belongings and furniture), and (8) consumer debt.

A conceptually appropriate measure of NEY would include imputed returns to assets as well as reported returns from assets. A house no less than a bond produces a stream of goods and services unrelated to current work effort. If assets with no reported return vary directly (inversely) with measured or reported nonemployment, failure to impute a return to assets will lead to a negative (positive) bias in the NEY coefficient. But while it is clear that some return should be imputed to assets, doing so creates several problems.

First, it is not clear what interest rate to use for imputing returns to these assets. The interest rate is important because, given observations on labor supply and net worth, the NEY coefficient will vary inversely with the interest rate.

A second much more serious problem is that certain kinds of assets are likely to be spuriously correlated with labor supply. For three reasons, this problem is likely to be especially severe for equity in one's home. First, the supply of mortgage loans will depend in part on how steady a worker the individual is. Second, home ownership normally entails a commitment to steady work to repay a large mortgage debt. Finally, both home ownership and full-time work are, in part, reflections of individual characteristics such as steadiness and ambition.

The spurious positive correlation between home ownership and labor supply may dominate the theoretical negative relationship between NEY and labor supply if an imputed return to the individual's equity in his

6 (cont.) home is added to reported NEY. Home equity accounts for about one-half of all assets for which no return is reported. And, even if only a 5 percent return is imputed to home equity, this one source of imputed NEY will be slightly larger than total reported NEY.

Finally, data on assets in the SEO are frequently missing so that an additional cost of trying to impute returns to assets is the loss of all the missing asset data observations.

Given the above arguments, we believe that an alternative procedure to imputing income to assets is desirable. The simplest alternative, which we have adopted, is to include in all regressions in addition to a reported NEY variable, a variable which measures the value of assets that have no reported return in the SEO. This approach not only provides a solution to the spurious correlation problem but also solves (or skirts) the problem of choosing the appropriate interest rate to impute assets. In the ISR-OEO study only data on the family's net equity in its home and the gross value of its cars were available and these were used as control variables in our regressions.

[7]The statement in the text should be qualified slightly. Guarantees and implicit marginal tax rates vary from state to state. In addition, eligibility depends upon other variables besides income. But for each P.A. beneficiary in the sample, it remains true that numerous nonbeneficiaries living in the same state, with the same family size, potential wage rate, and other characteristics, have the same budget constraint.

[8]The point in the text can be illustrated with the aid of the diagram. Hours worked is measured from left to right on the horizontal axis and total income is measured along the vertical axis. Assume both individuals have a market wage rate of OW. Further assume that if they earn less than G dollars (work less than H hours) they are eligible for a public assistance subsidy equal to $G less whatever they earn. Hence, the budget line is OGJW. (Although not all public assistance programs have implicit 100 percent tax rates as depicted in Figure 1, most did in 1967, the year when our SEO data were collected. The basic analysis is not altered by assuming a less than 100 percent tax rate.) I_1 represents an indifference curve of man I. It is tangent to the JW segment of the budget line at E_1. Man I, therefore, works F hours and receives no public assistance. I_2 represents the indifference curve of man II. Man II clearly has a much stronger aversion to work (vis-a-vis income) than does man I. He achieves a corner solution at E_2, works 0 hours and receives OG dollars in public assistance. Clearly, to the extent that work reductions are a voluntary response to the availability of transfers, the transfer is a proxy for taste differences.

8 (cont.)

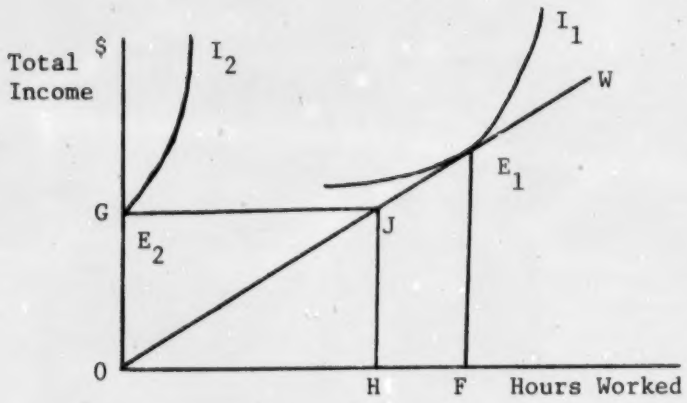

Figure 1

[9]In an earlier paper in which we estimated labor supply schedules of female heads of households, we also examined the labor supply elasticities of this group with respect to guarantees and tax rates in the Aid to Families with Dependent Children program. Because there are so few other P.A. beneficiaries, this procedure is not viable with other demographic groups.

There are two reasons for simply excluding P.A. beneficiaries in other groups from the sample. First, because of the implicit marginal tax rates in the P.A. programs, it is difficult, in some cases impossible, to specify the potentially effective wage rate that confronts P.A. beneficiaries. Consequently, including P.A. beneficiaries may distort wage rate coefficients. In addition, since a potential beneficiary must dispose of his assets other than his home before he can qualify for public assistance, P.A. beneficiaries will have no nontransfer NEY. At the same time their labor supply will be low. Thus including them in the sample and excluding P.A. payments from NEY may lead to a positive bias in the NEY coefficient. On the other hand, since P.A. beneficiaries can be expected to have lower than average wage rates and to work less than average, simply excluding them could lead to a negative bias in the WR coefficient. Since the NEY coefficients were virtually the same but the wage rate coefficients were less positive when P.A. beneficiaires were excluded, with the exception of female heads of households we report results only from samples which exclude P.A. beneficiaries.

[10]While it would be possible in principle to estimate the response of the unemployed to the parameters of the UC program that they confront, in practice it is nearly impossible to identify these from the SEO data.

[11]See David Macarov, Incentives to Work (San Francisco: Jossey-Bass, Inc., 1970), p. 87. It would be preferable to have data on what percentage of those eligible for pensions claim them. Unfortunately, we could not find such data.

[12]Another difference may be in transference of skill to the private market. That is, some individuals in the military or civil service might find a higher demand for their skills in the private market than other individuals.

[13]In the SEO we don't know which individual in the family receives the pension, but we assume it is the family head unless there is some other retired person in the family unit. We use this variable only when analyzing the labor supply of primary workers under the age of 73.

[14]We are assuming that all family members benefit from such social security payments.

[15]Hourly wage rates are unavailable for all individuals who did not work for wages during the survey week. This includes both the self-employed and the unemployed.

[16]There are some other less important sources of measurement error. Of these perhaps the most important stems from the confusion between gross and net earnings. Although interviewers were instructed to obtain normal gross weekly earnings, because many individuals are likely to know only their take home pay, there is undoubtedly some error due to confusion between gross and net. Experience in the New Jersey Income Maintenance Experiment suggests that it took many interviews for families to learn the distinction well and to consistently report gross earnings. See Harold W. Watts and John Mamer, "Wage Rate Responses," in Final Report of the Graduated Work Incentives Experiment in New Jersey and Pennsylvania (Report to the Office of Economic Opportunity, August 1973).

Note that when hours worked is the dependent variable, the measurement error will not be random. The wage rate variable will be negatively correlated with the error term and a negative bias will result.

[17]Because the samples in the first and second stage regression are not the same, the imputed wage rate is not an instrumental wage rate and therefore it may be biased.

[18]One exception may be confusion between gross and take-home pay.

[19]Because the few prime-age males who did not work must be assigned a potential wage rate, the reported wage rate measure is actually an amalgam of reported and potential wage rates.

[20]Because the major rationale for estimating these labor supply functions is to use them to estimate the effects of transfer programs on labor supply, this is a definite advantage which will be important in our forthcoming monograph on the issue of the effects of transfer programs on labor supply.

To calculate the reductions implied by the coefficients, one can multiply the income coefficient by the NIT guarantee, and, assuming that the existing tax rate is zero, multiply the wage rate coefficient by the NIT tax rate. The percentage reduction is simply the sum of these two divided by the mean labor supply of the sample population.

[21]Those age 62, 65 and 72 were excluded because some of them are likely to have been either 61, 64, or 71 during part of the year.

[22]When we included those who were prevented from working in the 66-71 and 73 or more year old samples, we found that the elasticities were somewhat generally smaller than or about equal to those reported in the text.

[23]Since both the wage rate and NEY coefficients may be in part a proxy for the availability of a job and the desirability of available jobs, we ran SEO regressions with a dummy variable for individuals who have some post college education. Most of these individuals are likely to be professionals. The inclusion of this variable in the regression increased the absolute value of most of the NEY coefficients by about 20 percent and decreased the wage rate coefficients by as much as 300-400 percent, and in the HLF_A regression the wage rate coefficient actually became negative.